

ABSTRACT

A method of immobilizing a catalyst on a substrate surface involves providing novel ligating copolymers comprising functional groups capable of binding to a substrate surface and functional groups capable of ligating to catalysts such as metal ions, metal complexes, nanoparticles, or colloids; applying the ligating copolymer to a substrate surface to cause the ligating copolymer to bind thereto, and contacting the modified substrate surface with a solution of a catalyst, causing the catalyst to be ligated by the ligating copolymer and thus immobilized on the substrate surface. The ligating copolymer may be patterned on the substrate surface using a method such as microcontact printing. A method of selectively metallizing a substrate in a desired pattern involves using a ligating chemical agent comprising functional groups capable of binding to a substrate surface and functional groups capable of ligating to electroless plating catalysts; applying the ligating chemical agent to a substrate in a desired pattern using microcontact printing to cause the ligating chemical agent to bind thereto; contacting the modified substrate surface with a solution of an electroless plating catalyst, causing the catalyst to be ligated by the ligating chemical agent and thus bound to the surface; and metallizing the catalyzed regions of the substrate surface using electroless plating.